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The Official Journal of the Rocks and Minerals Association

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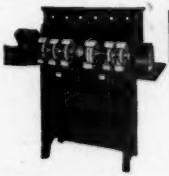

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ROCKS and MINERALS

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The Official Journal of the Rocks and Minerals Association

APRIL 1936

VOL. 11, No 4

WHOLE No. 58

Fluorescent And Phosphorescent Glacial Conglomerate

By HERMAN WUESTNER

At the north end of Linwood, a suburb of Cincinnati, Ohio, a ridge-like remnant of a glacial terrace extends north to Red Bank for a distance of about three-fourths of a mile. The ridge has a width of about 500 feet in places and reaches a height of 60 feet above the adjacent bottomland of the Little Miami River. The southern portion of the ridge, which has been rather completely worked out, consisted of sand and gravel overlain by loose red soil 10 to 15 feet thick near the center. The stripping away of this soil, from which the name Red Bank is derived, exposes patches, 10 feet in diameter, of fine sand cemented with calcite and limonite. These patches show kettle or trough-like depression in the center. The overburden of red soil seems to have been deposited after the underlying sand and gravel had become somewhat indurated, indicated by the sharp contact between the two. The sand and gravel have been removed to a depth of about 20 feet below the surface of the adjoining bottomland, leaving large, deep basins.

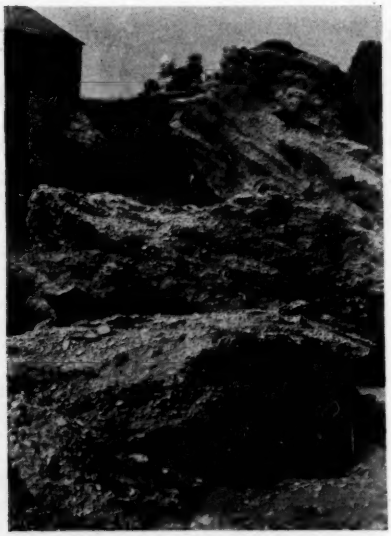
If we examine in profile the face of these workings, we find that the sandy patches consist first of a layer of fine sand and limonite several inches thick forming a hard crust, underlain by a foot or more of well-cemented fine sand and pebbles. These layers are underlain by from 5 to 10 feet of moderately hard sand and gravel conglomerate, grading downward into loose gravel.

These well-cemented masses were a hindrance to the men working in the pit, for when the loose gravel had been taken away from them they would fall to the bottom of the pit, or if they were considered dangerous a stick of dynamite would be used to dislodge them, so they would slip down to the bottom. In examining an old abandoned pit, we find that these blocks of "hard pan," as they are called here, literally cover the edges of the ridge while for about 200 feet at the center of the deposit very few if any are found.

While it is not plain what caused these sandy depressions, it seems as if they were produced by currents in the streams which deposited the materials. However, it is easily understood how the conglomerate was formed. The hard top surface held back downward percolating water, allowing it to trickle through slowly, giving it time to deposit the calcium carbonate which it held in solution and thus forming the conglomerate. while in the gravel without protection it would rush through, leaving behind no calcite as binding material. In all these numerous blocks of conglomerate, hardly any binding material can be

observed except in a single large block which was of unusual interest, especially with respect to a layer of coarse pebbles, up to several feet thick, which runs through it. This block was about 10x10 feet in diameter and from 15 to 20 feet high with the bowl-like cap still intact.

The pebbles were first coated with a thin layer of calcite, about one-sixteenth inch thick. In the openings between pebbles were then deposited films of calcite in the form of flat concentric arches, generally an eighth of an inch or less thick, with open spaces of about an eighth of an inch separating the successive arches.



Glacial Conglomerate exposed in gravel pit at Linwood, Ohio.

The arches are composed of acicular crystals of calcite, both top and bottom surfaces of the arches presenting a drusy appearance, since the acicular crystals show crystal terminations.

It might be pointed out here that the local bedrock is largely limestone, and that approximately sixty per cent of the pebbles in the local glacial deposits are of limestone. Thus there is an ample source of calcium carbonate available to percolating groundwaters. Furthermore, partial cementation of the glacial gravels, and stalactitic calcite deposits in cavities and caverns are a common feature of this vicinity.

The large block referred to above came to my notice about 20 years ago. Mr. C. B. Garrison, of Cincinnati, at that time took two photographs one of which is presented herewith. I was not able to obtain any large pieces with the small hammer I had with me at that time, and only one specimen is still in my collection.

Upon testing the calcite under an argon bulb a number of years later, I found that it both fluoresces and phosphoresces. I set out at once to obtain more material, but discovered that surface soil from the adjoining property had been washed down into the worked out portion of the pit covering all remaining blocks completely.

Several days later Mr. Garrison and I found another pit nearby in which were hundreds of blocks lying on the floor near the edges. We found two blocks of about 2 by 3 by 4 feet, each with a layer, about 8 inches thick, of coarse calcite conglomerate. Under the argon bulb the heavier coatings of calcite cementing material give a light green fluorescence, and a darker phosphorescence, while thin coatings give a darker green fluorescence but the phosphorescence is not as lasting.

Amateur Geologists Association

(Chicago)

The April meeting of the Association will be held Saturday, April 11th, in the Geological Building of the University of Chicago. The meeting will be devoted to the discussion of field trips for the summer and fall, location of mineral deposits in this area, and how and what to collect.

Meetings are held on the second Saturday of each month, G. Frederick Shepherd is Chairman, August Rassweiler is Treasurer, and A. Joseph Alessi (618 W. 25th Place, Chicago) is Secretary.

A New Fluorescent Mineral

By JAY T. FOX

Not long ago the writer received a specimen of plasma (quartz) which came from East India (Malay). Some time later, while testing minerals under the Ultra Violet rays, the plasma was also subjected. To the writer's amazement, it fluoresced so vividly that the effect was astounding.

We all know the vivid green produced when willemite is placed in the path of Ultra Violet but the plasma is by many times more lively. It fluoresces a very dazzling green while under ordinary light it is but a dreary yellow green and very transparent. The specimen, however, is not to be confused with the opaque green masses from Central India which are usually supplied by mineral dealers. The opaque material is not fluorescent.

The writer never heard of any report covering this type of plasma and so passes his discovery on to those fellow members who likewise are interested in fluorescent minerals. Have any readers of ROCKS *and* MINERALS had a similar experience?

Portable Device To Identify Fluorescent Minerals

By OSCAR R. SMITH

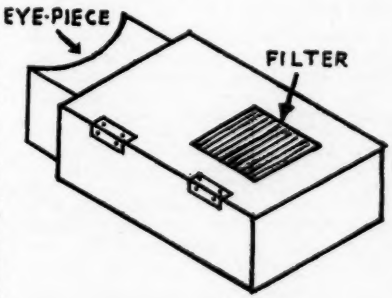
At the Rocks and Minerals Association outing held at Franklin, N. J. on May 19th, 1935, the writer used a device to identify fluorescent material which seemed quite new to most of those present.

Briefly, it may be described as a box 8"x4"x4" with a hinged top. One end of the box has a large opening cut into it and over this is built a hood so as to exclude as much visible light as possible when looking into the box. The lid has a hole cut through it and over this opening is fitted an ultraviolet filter. The writer used a Corning No. 597, 3⅛" square by ¼" thick.

The specimen is placed in the box, the lid closed and the whole held in such a way that the maximum available sunlight will pass through the filter and impinge upon the specimen.

The result is well worth the work involved in making the device. You'll never go hunting fluorescent material without it once you have used it. But few realize the amount of ultraviolet present in the rays of a summer sun!

Fair results will be secured with a 150 watt or a Photoflood bulb as a light source. For a cheap filter substitute fair results will be obtained with some of the almost opaque glass ash trays usually sold for ten cents.



Fluorescent Minerals From Little Known Localities

By DAVID SEAMAN

Selenite crystals from 3 miles south of Golden, Colorado, between Golden and Morrison, are both fluorescent and phosphorescent. The crystals occur imbedded in clay in a pit located just a few hundred yards down the cement road where the dirt road leading south from Golden to Morrison joins it. This point is about 3 miles south of Golden. The crystals in the clay range from ½ inch to 2 inches long and one was found by the writer 4 inches long by 1½ inches thick. The selenite crystals under the argon bulb show an olive green fluorescence which is more pronounced about the edges of the crystals. The phosphorescence is more spectacular and the crystals glow with a light green color for 10 or 15 seconds after the light has been turned off. All of the crystals react positively, but fibrous selenite also found here does not.

Fluorite in several different colors from Wagon Wheel Gap, Colorado, fluoresces a light blue with the argon lamp. The white, the light green, and the light purple show this phenomena while the dark purple is negative.

Light green fluorite in small specks in the ore from Creede, Colorado, fluoresces a light blue color. This fluorite is associated with amethyst quartz, galena, and brown sphalerite which do not show any fluorescent phenomena.

Deep green octahedrons of fluorite associated with crystals of hubnerite from Silverton, Colorado, give a light blue fluorescence.

Some of the bands of amber colored opal in the agate opal of Specimen Mountain, Rocky Mountain National Park, Colorado, fluoresces a light green under the argon lamp.

Light brown semi-transparent chalcedony from the andesite cliffs to the east of Phipp's Ranch, 4 miles south of Creede, Colorado, gives a beautiful light emerald green fluorescence. Most of the chalcedony of these cliffs however, do not fluoresce.

Brown calcite from the amygdaloids in the basalt of North Table Mountain, Golden, Colorado, gives a yellowish green fluorescence and phosphoresces a darker green. Some of the brown calcite also fluoresces a bright yellow but does not phosphoresce. White calcite from this locality is negative in the specimens tested.

Dog tooth crystals of white calcite penetrating amethyst quartz from Lake City, Colorado, give a light orange colored fluorescence.

Tiny quartz crystals with inclusions (probably carbonaceous) imbedded in a calcite vein in Benton Shale from 7 miles north of Boulder, Colorado, along the Boulder—Lyons Road, show light blue-green spots from the inclusions.

Quartz crystals with inclusions (probably carbonaceous) from Little Falls, New York, show light blue-green fluorescent spots from the inclusions. Only certain crystals show this phenomena while similar appearing crystals do not. These crystals should be studied fully by one who is a specialist in this field under all types of fluorescent lamps.

Light brown calcite from the cave at Mann's Choice near Bedford, Pa., fluoresces a light sea-green color and phosphoresces also a light sea-green.

Some of the calcite from the Luray Caverns of Virginia fluoresces a light green. A portion of a polished stalactite was tested and here the lighter bands (nearly colorless and transparent), showed the phenomena while darker bands did not. Several specimens from the Endless and Shenendoah caverns gave negative reactions. If more specimens were tested perhaps some positive results might have been obtained.

Autunite scales on pegmatite from Newry, Maine, collected by the writer, give a very brilliant bright green color.

Moss agate from Bridgeport, Nebraska, fluoresces a blue green while ordinary agate and chalcedony from the same locality is negative.

All of the enumerated results were obtained with the common argon lamp as that is the only type of lamp that the writer possesses.

For those who may wish to test these specimens further or any particular ones, the writer will only be too glad to lend them to responsible parties, the address is 6321 Howe Street, Pittsburgh, Pa.

Occurrence of Fluorescent And Phosphorescent Calcite Crystal Shell Casts In The Yorktown Formation, Virginia

By GEORGE C. BARCLAY

The Yorktown formation is the youngest of the series in the Miocene epoch. It is underlaid by the Saint Mary's which rests on the Choptank and it in turn on the Calvert formation. The name Yorktown was given this formation by Clark and Miller[1] as being most appropriate, for the best exposures occur along the south bank of the York River at Yorktown, Virginia. The outstanding features about the formation are the well preserved condition of the fossils, both the external and internal features of the shells being preserved in detail, and the abundance of coquina. This formation differs chiefly from the older Miocene formations by the occurrence of coquina. This member is about 50 feet thick. In some parts it is loose and crumbly, in others solid and massive. It is composed of finely broken marine shells cemented together by calcareous material and colored by iron oxide. Throughout its entire depth the Yorktown formation exhibits definite zones or stratas of shells, whole and broken, separated by sands and occasional shells. Throughout the entire formation, distributed sparsely, are found bones and bone material, possibly that of the whale, also shark vertebrae and teeth. Some of these zones, like the coquina, are packed loose and some cemented into a solid mass. It is in the strata of indurated matter that the calcite shell casts occur. They are found sparingly throughout the entire hard mass of the York River exposure, but they are more abundant where this indurated shell mass is exposed by river erosion about one and a half miles north west of Yorktown on the left bank of the river. It would appear that these calcite crystal casts are the result of the surface water perculating through the upper strata of fossils and coquina dissolving the calcite on its way through and redepositing it in the form of crystals in the shell cavities. Some of the forms are extremely well preserved and the crystals are a beautiful yellow tint. They radiate from a central point outward to the inner surface of the shell that was. The shell itself in many cases having entirely disappeared. These casts, especially on their freshly broken edges and exposed parts, fluoresce a beautiful green, and phosphoresce, in some instances from five to ten seconds after excitation, under the violet rays. As far as is known from constant and repeated tests these crystal shell casts are the only material in the entire formation showing this phenomena.

[1]Clark, William B. and Miller, Benjamin L. *The Physiography and Geology of the Coastal Province of Virginia.* Virginia Geological Survey, University, Va., Bull. No. 4, p. 158.

Joys of An Argon Bulb

By W. RITCHIE ALMOND

We were showing off the cut opal collection that phosphoresced so brilliantly under the argon bulb. The visitor, having a fondness for the candied ginger, reached up for the dish and lowered it into the violet light. His finger was poised to seize a generous piece when it froze in mid-air. The ginger, on each top surface, was a dull, poisonous green with the surrounding cut-glass fluorescing a faint, sickly greenish hue.

Like all the rest who acquire argon bulbs, we have tested everything in sight. We have carried home pounds of rock just on the chance it might fluoresce. Only once have we been rewarded; the good wife picked up a five-pound rock that was finely peppered through and through with autunite (Bedford, N. Y.). Not that we knew what it was when we stumbled over it. Being the rankest kind of amateurs with no mineralogical background, we are possessed only of an innate curiosity as to the nature of the rocks about us—a curiosity that beguiles us into many an excursion and into much back-breaking exercise. But what a hobby!

Even though we thought we had tested everything in the house, it was sheer accident one night when my wife walked into the room darkened except for two argon bulbs. Instantly the fleece lining of her sheep-skin slippers took on a yellow radiance that was almost uncanny.

An embarrassing situation arose one night when demonstrating to a group the fluorescence of teeth. The subject's top row were the usual green under the violet argon bulb, the lower ones orange. We had not expected this of "store teeth," but it never fails to pick them out. The effect is quite startling.

One night the pale violet rays fell upon my rifle. I wondered why it gleamed with a soft but vivid green light until I remembered having oiled it. The argon lamp revealed all too well the spots untouched by grease.

Although the play of colors on oils under the argon bulb is a foregone conclusion, my exhibit of fourteen samples from crude Wolf's Head oil through various stages of refinement never fails to be greeted with enthusiasm. No two have the same bright blue or green color. The black petrolatum is particularly unbelievable in its color change.

The average visitor to our two-room "museum" is always skeptical about the sanity of one who messes about the countryside pawing over the piles of rocks designated as "swell dumps." A guided survey of the specimens collected, however, begins to dispel the visitor's doubts. At the psychological moment a black wooden box is produced with an odd assortment of wholly unattractive bits of rock. On being told to examine them closely, his doubts as to the sanity of the collector return in full force especially if he is inadvertantly told that this is the "cream" of the collection. Of course, turning out the lights is pure hokum until the "funny-looking" bulbs are switched on. Then my prestige goes up ten full points. The dirty-looking willemite has turned to gorgeous green. The pale pink bustamite is a dazzling rose. Glassy, violet-tinted gray fluorite has become a deep royal blue. A black stone with glints as of mica (sphalerite from Tsumeb, S. W. Africa) shines like a million deep orange-colored stars. The semi-opal slab shows a greenish glow. Colorless crystaline aragonite from Sicily blushes like a peach. Bermuda calcite glistens with a good green color throughout its rosetted length. The wernerite shines as though a lemon yellow light were hidden within its depths. These are the choicest of the group acquired from Ward's.

The argon fever is on. Even paraffin wax takes on colored beauty. Gum gatti shows spots of rose and green. Uranium nitrate trapped in a bottle possesses an unearthly and brilliant green radiance. What an assortment of greens there are in the fluorescent group!

An argon bulb is splendid bait for entrapping unsuspecting mortals into the rock-collecting fraternity. And even if it can not ensnare them, it at least prevents them from regarding the mineral addict as wholly crazy.

The possessor of an argon bulb will find his time well filled. When he is not experimenting, he is apt to be philosophizing. Here is contradiction of what he learned in physics: the wave length of light is unalterable. Light from the ultra-violet moves up into the visible range. Some chemical group or some physical configuration within the specimen is capable of lengthening the wave length of the light that falls upon it and is reflected back. Why is it that fluorescence is so tantalizing? Why do not all the parts of a single mineral sample fluoresce? Is it a trace of impurity that produces the effect or is it the purity of the sample that is responsible for fluorescence? Manganese seems to get the most blame, manganese the impurity. When such cranial exercise gets too involved, one retreats to the cellar to "dope out" a portable argon bulb for field trips, success always remaining imminent.

It has been said (Chemical Abstracts **28:** 4836) that ointments which afford protection against light fluoresce strongly under ultra-violet light. I have not found the argon lamp powerful enough to excite this; it is possible that the ointments tested were no good too.

All in all I can not complain at the service my argon bulbs render me. They do a quick and effective job when I get out the amateur photography equipment. A single bulb cut the time of exposure in printing down to one-third of what my regular lamp requires. Then too when I am not using a box for printing, the argon bulb has an extra advantage; there is no bright and dazzling light to be turned out leaving one straining to see the picture taking shape in the developing bath.

Here's to the health of every F. A. B. F. (Fellow of the Argon Bulb Fraternity)!

Notes On The Separation Of Two Rock Crystals

By PAUL ZIMMER

One evening, while going over my microscope slides, I accidently put one under the argon bulb. To my surprise it fluoresced a light green. I then went over all of the slides and found that they also fluoresced. As these slides were made by me, I started going over the various substances that were used to make them in order to find out what caused the fluorescence. I found that the Balsam used to join the cover slip to the slide was the substance that fluoresced. I made a note of this, little realizing that some day it would prove of value.

Some few months later, I was reading the **Readers' Section** of the Dec., 1934 issue of ROCKS *and* MINERALS. There I came upon Mr. A. J. Harstad's note concerning two rock crystals that were joined together in the form of a T. The junction between the two crystals fluoresced a light green which made him suspect that the crystals had parted and had been glued together again. Mr. Harstad wanted some information on separating them. I immediately thought of my microscopic slides and wrote him stating that Balsam which is used as an adhesive is soluble in Xylene. He in return sent me the crystals to separate if possible. After soaking them in Xylene for four days, I began to get discouraged, but on the fifth day they came apart. I tested both crystals under the argon bulb but found that neither would fluoresce so decided that the Xylene had dissolved the adhesive material whether it was Balsam or not.

Balsam is a resin from the Balsam Fur tree. When liquid it is slightly yellow but on hardening it is as clear and about as hard as glass. The Xylene which dissolves Balsam is also good for cleaning crystals. I found that when crystals are handled, a thin greasy film soon covers them and spoils their luster. Xylene removes this film, if applied and rubbed off with a clean soft cloth or lens paper.

Occurrences Of Hyalite In North Carolina

By JOHN R. HENDERSON

The section of North Carolina producing the finest and most interesting specimens of Hyalite centers around the mountain resort of Little Switzerland. This district includes portions of Mitchell and Yancy Counties. It comprises the S. W. corner of the theoretical quadrangle formed by latitudes 36° 00' — 35° 50' and longitudes 82° 00' — 82° 10'. It is bounded by Crabtree Mountain on the North, Seven Mile Ridge on the West, Little Switzerland on the South, and McDowell county on the East. Mt. Mitchell is some 12 miles farther S. W. and Spruce Pine about 11 miles N. E.

The Hyalite district is in the heart of the mountain section of the state. The altitude averages well over 3,800 feet. It is drained by Crabtree Creek, which flows into the North Toe River. Being in the feldspar and mica Belts there are many mines within here which produce these two minerals as well as a host of accessory minerals of which Hyalite is but one. Among the other varieties which have been and are being found here are: Garnet (several different species), Sphalerite, Emerald, Uraninite, Uranophane, Cyrtolite, Gummite, Clarkeite, Autunite, Torbernite, Columbite, Samarskite, Tourmaline, Aquamarine and different forms of Quartz.

Feldspar is the most common mineral mined on a large scale in the North Carolina Mountains. There is little being done in the way of mica mining partly because of the low prices and small demand, and partly because of the poor quality of most of the mica itself. It is sold as a by-product of the feldspar industry. There is a small mica schist plant at Spruce Pine for the grinding of this substance. There are no schist mines in the Hyalite section proper, however.

General Geology

The formations outcropping throughout the entire Appalachian Range consist of two groups of greatly differing age and character. These are (1) igneous and metamorphic rocks represented by gneiss, schist, granite and diorite; and (2) sedimentary strata of lower-Cambrian age, including conglomerate, sandstone, shale, limestone and the like.

Local Geology

Igneous and metamorphic rocks of Archean age predominate. Carolina Gneiss covers most of the Hyalite Area. This is composed chiefly of mica-gneiss and mica-schist and other gneisses, schists, granites, diorites, and small lenses of marble. There is some Roan Gneiss represented by hornblende-gneiss and diorite.

Entrance to Hyalite Section

To enter the Hyalite section one must come over the newly hard- surfaced U. S. Highway 26 from either Marion or Spruce Pine, N. C. to the Post Office at Little Switzerland. Here you turn off on the Crabtree Road. This is of clay, covered with broken stone. At the turn off at Little Switzerland is a sign saying, **Three miles to the McKinney Mines.** This should serve as a landmark to anyone considering a visit to the district.

Information About Hyalite

In all cases of Hyalite occurrences in this section of the State, it occurs as a coating or crust on a matrix of feldspar or on smoky quartz. This crust varies in thickness from microscopic to perhaps one-half inch. The crust is of a peculiar stalactitic structure familiar to every one who posses a specimen from the section. Most of the specimens in collections are there because they respond to the various forms of Ultra Violet Ray Lights. This kind of Hyalite is not the only variety of the mineral to be found, however. Besides the white fluorescent type there is a white Hyalite which is neither fluorescent nor phosphorescent, also colored Hyalites as Blue Hyalites, Green Hyalities, Yellow Hyalites, Brown Hyalites and different shades and combinations of two or more colors. With the exception of the White Hyalite, it is very rare to find specimens which show up under the U. V. Rays.

The Hyalite is found in seams or cracks which sometimes extend for a

hundred or more feet across the face of a mine opening. The seams are always horizontal. In diameter the seams are quite narrow usually only one-half to one and one-half inches; the seams also vary in diameter as they are opened up getting either wider, narrower or pinching out altogether. For a general rule, only the upper surface of the cracks are coated with Hyalite, occasionally the lower one is also, but the two crusts are never found joined together so as to completely fill in the seam. Wherever the seam widens out the Hyalite crust is thicker and wherever it narrows the Hyalite gets thinner.

Unfortunatey, that section of a mine which produces Hyalite almost invariably is the poorest as far as feldspar is concerned . This tends quite obviously to keep the output of specimens to a low level. In many of the mines when a seam of Hyalite is exposed, the feldspar will start running so poorly in quality or quantity that the whole area will be deserted or else the entire seam of Hyalite will be blasted out. The latter alternative is rarely adopted. Specimens suitable for cabinets are available only when a seam is just being uncovered or when work is being done in the part of the mine where the Hyalite occurs. Usually a mine will produce a surplus of exceptionally fine specimens for a few days and then perhaps never give another specimen as long as it is operated or if so from a different seam. This is due to the fact that often no farther development of the mine is practical in that part of the pegmatite.

For the reason outlined above and because of the poor roads or lack of any at all which characterizes the district, I shall not attempt to tell how to get to the various mines which are producing or have produced specimens in quantity or of unusual types, but will content myself with describing some of the best specimens found in the section and also to list the different mines as to their approximate location.

Mines and Specimens

Pittman Mine: The Pittman Mine is the most accessible of all the mines which have given fine cabinet specimens of Hyalite. It is three miles from Little Switzerland on the Crabtree Road. From here have come by far the most beautiful of the Blue Hyalite Specimens. These came from a seam extending across the face of the working about three-fourth's of the way up. This seam has not been disturbed for several months. The Blue Hyalite from here is characterized by the thickness and transparency of the crust and the deep blue of the coloring. The best of the specimens from this mine now reside in the collection of Dr. H. P. Barret of Charlotte, N. C.

Specimen: A specimen in the collection of the author from this mine rivals any ever taken out. It is on a pure white feldspar measuring 6"x6" The Hyalite is thick but does not cover the matrix very densely; it is transparent and about one-third of the Hyalite is a beautiful blue, the rest is white. The specimen in addition to bring unusually attractive is also rare in that all the Hyalite shows very good results under the U. V. Rays. It shows both fluorescence and phosphorescence. The specimen was obtained from Mr. R. B. Ballew of Little Switzerland, who in turn got it from one of the workers at the mine.

Other minerals from the mine: Besides the wonderful blue Hyalite, some white was found in the extreme upper working of the mine. This was noted in May of 1935 by Mr. Ballew and the author. Two seams, containing Hyalite, were observed in the wall rock. From one, several nice specimens of a clear "water hyalite" had been blasted and were available. The other seam had an abundance of ordinary white; neither of the two types responded to the Argon Bulb source of U. V. Rays. At a subsequent visit in early September, no trace of the two minerals could be seen.

The Pittman mine has also given some extremely fine specimens of green Torbernite Crystals on smoky quartz. This is best obtainable from the dumps rather than from the workings.

McKinney Mine: The McKinney Mine although by far the largest feldspar mine in North Carolina and on the same collossal Pegmatite as the Pittman, has produced next to nothing in the way of Hyalite. The accessory minerals are radically differ-

ent from the Pittman's too. The only specimen of Hyalite from this mine to the author's knowledge was found by him on the tremendous quartz dump. This was found May 26, 1935. The occurrence is decidedly unique. The specimen is of smoky quartz partially covered with green Torbernite crystals, itself very rare at the mine. Part of the Torbernite crystals are covered with a microscopic film of Hyalite which fluoresces under the U. V. Light. When first tested in this way because of the manner in which the Torbernite crystals were outlined, the conclusion was reached that the Torbernite was altering to fluorescent Autunite. This was proved erroneous by Mr. E. P. Henderson of the National Museum in Washington to whom the specimen was sent for verification of the writer's opinion.

Other minerals from the mine: From here have come some very pure Columbite, Samarskite, and Sphalerite; none however, in the form of Crystals.

The author has recently discovered some crystallized Columbite and Samarskite at the mine.

Huskins Mine: This mine is on Seven Mile Ridge in Yancy County whereas the rest of the Hyalite comes from Mitchell County. It is about one mile S. W. of Crabtree Falls and about four miles from Little Switzerland but is entirely inaccessible by automobile and to be reached by foot requires considerable adeptness at mountain climbing. From this mine comes the yellow to brown Hyalite. Most of this is in the form of crusts detached from its matrix and averaging perhaps 2"x2". This material shows very vivid fluorescence of the common yellow-green color. This is best observed on the bottom of the crusts. There is no phosphorescence, at least not with the Argon Bulb. The crusts of Hyalite from this mine are at least twice as thick as the average from the other mines.

Ballew Mine: This is more of a prospect than a mine and is the only one which is operated exclusively for Hyalite. It is worked on an option by Mr. Ballew. He has been taking the mineral out constantly over a period of two years. Specimens from the mine have been sent all over the United States and even to Europe.

The opening is on the side of Crabtree Mountain about one-half mile from Crabtree Falls and like the Huskins mine is not accessible by car. From here have come most of the specimens now offered for sale throughout the country. There are two seams producing the Hyalite but usually only one at a time gives the type which best responds to Ultra Violet Light. The Hyalite ordinarily occurs on feldspar but at the present is giving some on quartz. Sometimes a large proportion of the Hyalite is not suitable for exhibition under the U. V. Rays and at other times all that is taken out shows up very well. All of the Hyalite responds to some extent or another and all is both fluorescent and phosphorescent. No other interesting minerals occur here.

Laster Mine: The Laster originally started out as a mica mine but now is worked for feldspar. Hyalite here is rare but the mine has produced several interesting specimens.

Specimens: Mr. Ballew has a specimen on smoky quartz 5"x10" which is unparalleled in its coloring. The Hyalite is of a fine light aquamarine green and is extremely thick and dense.

The author has a specimen of quartz of some size from this mine which is thickly and densely coated with a conglomeration of green-yellow-brown and a bit of blue Hyalite. It is fluorescent only at the line of contact between the mineral and its matrix. Mr. Ballew's is uniformly fluorescent.

Hollifield Mine: This mine is about half way between the Pittman Mine and Crabtree Falls. It has not produced many specimens but such as it has have been very beautiful. The Hyalite from here is on quartz and is bright blue. It is never found very thick nor dense but the Hyalite is deeply and uniformly colored.

The best fluorescent Autunite in North Carolina, at present, is coming from the Hollifield Mine.

Phosphorescent Selenite From Hudson, N. Y.

By **PETER ZODAC**, Editor ROCKS and MINERALS

Along the east bank of the Hudson River, in Hudson, New York, are many abandoned clay pits. Some of the pits are about ½ mile long, 500 feet wide and 100 feet deep. The clay had been excavated for brick manufacture; the pits were abandoned about 1920. Selenite crystals are very numerous in these pits and vary in length from minute up to two inches. They likewise vary in quality—some are perfect and transparent—others imperfect, deeply etched, or containing clay inclusions. Sometimes all three imperfections are present in one crystal; other times two of them occur.

Mr. Carl Klein, of Hudson, N. Y., first called the writer's attention to the selenite, and that they phosphoresce. He also was gracious enough as to supply the writer with many specimens. Furthermore, Mr. Klein arranged for a mineralogical tour to a number of interesting localities around Hudson, of which the clay pits were one. On May 5, 1935, the writer, accompanied by Mr. and Mrs Emmet Doherty of Peekskill and Mr. and Mrs Henry Thurston of Montrose, made this tour.

The first locality visited was one of the clay pits. We found the pit to be a large one. The clay, which was still present and well exposed, was of two varieties—light and dark bluish in color; the dark being on the bottom. It was in the dark bluish clay where selenite crystals appeared to be most prolific; this may have been due to the fact that the crystals, falling out of the lighter clay above, had rolled down to the bottom. At any rate the crystals were so plentiful that a cigar box could easily have been filled up within 10 or 15 minutes. Some of the crystals laid fully exposed—loosely on the clay; others projected out either sideways or lengthways; still others had one corner showing which often required keen eyesight for their detection, especially if they contained the clay inclusions as their color blended with the surrounding clay. The crystals were easily removed without any damage to them; the clay was so soft the crystals could be dug out with the fingers. Of course digging into the bank, a foot or more, would require a shovel but this was not necessary as enough crystals were exposed to satisfy a dozen average collectors. The crystals were doubly terminated and in the majority of cases occurred singly; now and then penetrating crystals (twins) were found.

By exposing a selenite crystal to ordinary electric light, for a minute, the crystal would glow for a few seconds. Better results were obtained when the crystal was held up against the bulb—about an inch away—at the same time keeping the eyes closed. Then at the same instance the light was turned off, the eyes were opened —the phosphorescence was greatly increased. Exposing the crystal to an argon bulb gave still better results. The phosphorescence was a pale whitish glow.

The best results however, were obtained when crystals were exposed to a cold-quartz lamp. Some of the crystals phosphoresced a light-blue; others a golden yellow; still others part blue with tips of yellow, and other combinations. The quartz lamp and argon bulb have an additional advantage in that, if attached to lead cords, the light can be held down over a mass of crystals; thus those crystals which do not phosphoresce can be easily seen and removed, or vice versa. All crystals from Hudson do not phosphoresce, but the majority examined do.

A Homemade Fluorescent Lamp

By WILLIAM C. CASPERSON

Mineral fluorescence has passed beyond the stage of being merely an interesting phenomena. It has become a practical necessity to the mineralogist and to the scientific collector of minerals. It is useful, not only as a means for the positive identification of mineral types and chemical substances, but also in detecting deceptives and artificial construction of specimens.

So great has become the interest in fluorescence that practically every collector either has some kind of Ultra Violet or high frequency machine for producing it, or intends at some future date to secure such a device.

Two problems face the average collector who intends to secure a fluorescent exhibit. One is the kind of Ultra Violet source to select; the other is the prohibitive cost of many of the devices which produce Ultra Violet light.

To get the greatest satisfaction for general use, the collector should select a source that will give the widest range possible in the Ultra Violet Band in the spectrum and at the same time produce the greatest quantity possible of Ultra Violet units.

Many devices for producing fluorescence are well advertised by those placing them on the market or through articles on the subject appearing in magazines so that a collector has a number from which to choose that give good results. No one device, however, gives all that is desired in fluorescence.

For the benefit of many collectors who wish an efficient and practical source of Ultra Violet light, I will describe a simple device I have used which has proven very satisfactory.

Recently a type of electric bulb has been placed on the market primarily for use in photography where artificial light was required for taking pictures. One of these bulbs, called the Photoflood, a product of the General Electric Co., sells for 25c and lasts two hours in constant use. Another, is made by the Wonderlite Co., called the Pictureflood, costs 35c and lasts five hours. Either of these bulbs will serve the purpose.

I simply use one of these bulbs in a projection box which can be made by any collector and place a filtering lens in front of the bulb. The box is about 12 inches long, 10 inches high, and 8 inches wide, outside measurements. It may be made of either metal or wood. Cut an opening in the front end of the box, 6x6 inches, to accommodate a filtering glass 6½x6½ ins. Fasten a bulb socket properly wired in the bottom of the box midway between the sides and about 6 inches from the front end. Fit an electric plug in one of the upper corners and an electric switch in the other upper corner of the rear end. The wiring of the plug, switch, and socket is a simple matter and can be done by any collector.

If desired, a system of ventilation may be used. The space of about 2 inches in the top of the box may be utilized for this purpose. One method is to fasten between the bulb and the top, 5 strips of thin tin each about 3 inches in width and the length of the box, staggering them in their position so that they will serve to baffle the light and prevent its escape. The first two strips may be tacked or fastened to the sides and ends just above the bulb and slightly slanting upward, leaving an opening in the center above the bulb, between the strips. A single strip is then fastened at the ends directly above the opening between the two lower strips. Finally fasten the two remaining strips to the sides and ends in similar position to the first two strips. If spaced properly and in correct position there will be a zigzag opening from the main body of the box to the space in the top of the box. Now drill ½ inch holes along each side of the box about ½ inch from the top to permit the heat which arises through the baffle to the top of the box to escape. Even with ventilation, there will be considerable heat and care must be exercised to prevent overheating.

A simple method for holding the filtering glass in position is to make a

sliding frame for it, leaving the top open so that the glass may be readily raised and lowered. Fit the glass as snugly as possible to prevent leakage of light but allow the glass to slide freely.

The type of filtering lens to be used depends upon what minerals are to be activated. For general use the most satisfactory one is the Heat Resisting Red Purple Ultra No. 587 manufactured by the Corning Glass Works of Corning, N. Y. A lens 3⅛x3⅛ inches square, costs 85c. The 6½x6½ inches square size costs $3.25 and will give the best satisfaction.

The box must be absolutely light tight, and should be enameled white inside. A reflector may be placed behind the bulb if desired.

Avoid overheating by using the light for short periods of time. The intervals will not only permit cooling but conserve the life of the bulb.

Do not allow the glass to become so hot that you cannot hold your hand on it. If the box does become very hot, as it will while using it for any length of time, raise the lens in the slide and set it aside to cool off.

This light will give surprisingly beautiful fluorescence. While the results are similar to those of the carbon arc with the same lens, it produces a greater variety of colors and a number of minerals show up more beautifully. The effects are practically good on the Franklin, N. J. minerals; English, Mexican, New Hampshire, and Nevada fluorites; Canadian wernerite; curtisite; semi-opal; aragonite from Sicily in particular; sulphur; barite from California and barite rose from Texas; white topaz from Africa which turned to golden; utahlite which showed orange and red; and many others. I do not as yet know the full scope of its effects.

This light does not, however, produce the phenomena of phosphorescence.

The Blue Purple Ultra No. 585, made by the same company, also gives some very interesting results. The Franklin minerals do not, however, fluoresce as well. Willemite becomes yellow. But garnet fluoresces a very beautiful red. Zincite becomes almost transparent and more intensely red as does also crocoite, cinnabar and all minerals I have exposed containing iron oxide. Even iron pyrite shows deep red reflections. Green gem apatite became a deep orange-red. Joplin golden calcite fluoresced a brilliant orange-red. Sulphur showed a very deep red. Aragonite from Sicily fluoresced a vivid pink and was the most beautiful specimen of fluorescence I have ever seen. Nearly all Paterson minerals showed some kind of fluorescence. Datolite, stilbite, pectolite, thaumasite and prehnite were the most noticeable. Tiger eye from Africa showed a variety of colors and a beryl from Bedford, N. Y., naturally a yellowish-green, turned to red, blue, green, and purple and was beautiful to behold..

The Blue Purple Ultra is a detector of the presence of iron oxide in every case in which I have tried it.

Both of the filtering lenses just described have merit but for general uses most collectors will find the H. R. Red Purple No. 587 the better of the two.

I am sure results obtained from this Ultra Violet device will delight any collector who uses it and its relative low cost makes it one of the most complete, efficient, and inexpensive methods for obtaining fluorescence.

Editor's Note—The inside of the box could be lined with asbestos to prevent overheating.

Gold, Silver, Gems—Locations:

After a two year research, the GeMiMe Foundation, P. O. Box 1622, Denver, is publishing locations of Gold, Gold bearing minerals, Silver, Silver bearing minerals and gem stones occurring in the eleven best mining states, viz: California, South Dakota, Colorado, Arizona, Utah, Nevada, Montana, Idaho, Oregon, New Mexico and Texas. These location guides are in pamphlet form and may be used singly, or if desired may be consolidated under one binder. They are pocket size.

In addition the GeMiMe Foundation publishes the names, locations, etc. of gemstones in the following states and elsewhere: Alabama, Arkansas, Canada, Connecticut, Delaware, Florida, Georgia, Iowa, Illinois, Indiana, Kansas, Kentucky, Lake Superior, Lake Huron, Luray Cave, Maryland, Massachusetts, Maine, Mexico, Michigan, Minnesota, Missouri, Mt. Diablo, Nebraska, New Hampshire, New York, New Jersey, North Carolina, Nevada, Ontario, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, Washington, Wisconsin, Wyoming, Yellowstone Park.

These supplements are the same size and can be put under the same binder with Gold, Silver and Gemstones of the eleven best Gold and Silver producing States.

Some Notes On Fluorescence

By LEO NEAL YEDLIN

The writer, in the course of testing specimens of minerals in his collection for fluorescence, both under the Iron Spark Gap, and the Argon Bulb, has noted the following results.

Name	Locality	Iron Arc	Argon Bulb
Colemanite	Inyo Co., Cal.	Blue Fl. Blue Ph.	Blue Fl.
Thenardite	Columbus Marsh, Nevada	Blue Fl. Blue Ph.	Blue Fl. Blue Ph.
Calcite (Strontiocalcite)	Paterson, N.J.	Greenish Ph.	Greenish Fl. Greenish Ph.
Fluorite (red) with Apatite	Franklin, N. J.	Green Ph.	Nil.

Fl.—Fluorescence
Ph.—Phosphorescence

In the course of experimenting with the Argon Bulb the writer ascertained that unusual results might be obtained if the visible light were filtered, and only the ultra-violet permitted to activate the specimen to be examined.

Consequently a filter, 3x3 inches in size, (manufactured by the Corning Glass Works, Corning, N. Y., and designated as "Red Purple Corex A") was set in a frame, and so placed that it shielded the specimen from visible light, and permitted the U-V ray to fall upon it.

A number of minerals, known to fluoresce under the Nico lamp, or the Iron Spark Gap, showed definite and pleasing results under this combination. In addition, the non-fluorescing matrix of a number of minerals was blackened out, and the fluorescing mineral stood out in bold relief. Ordinarily, such matrix takes on a violet color, which is often mistaken for true fluorescence.

Franklin Calcite (Spartaite) became a deep scarlet, similar to that exhibited by the specimen when exposed to the Iron Arc. White Aragonite from Roumania showed a delicate green color. Australian Opal fluoresced green, and the three minerals listed above showed results, which were not visible when the filter was not utilized.

So too, numerous minerals, which do show good results under the bulb, are intensified, and their true color action, without the violet light, can be determined. The cost of the filter is not great, and is certainly justified by the results obtained.

Fluorescent Opal From Arizona

Near Bagdad, Arizona, a prospector recently discovered a bluish opal which is not only attractive as a specimen but which fluoresces a nice green while its matrix phosphoresces beautifully as well. A demand for the mineral will soon be apparent once collectors learn of it.

Dr. G. M. Butler of the University of Arizona to whom specimens were submitted for examination says:—"The opal does fluoresce beautifully under the nico, the iron arc, and the "Lifelite" lamps, and the effect is especially beautiful under the nico lamp. Moreover, the calcite with which it is associated phosphoresces blue after being exposed to the "Lifelite" lamp or the iron arc."

The opal, in small bluish masses, is imbedded in white crystalline calcite; a thin dark zone forms the contact between the two minerals.

The deposit occurs as small stringers in "tufa" near Bagdad, about 26 miles west of Hillside, the nearest railroad station, near the Mohave-Yavapai county line.

Credit is due Luther Steward, 51 Mitchell Drive, Phoenix, Arizona for bringing this unique mineral to the attention of mineral collectors.

THE AMATEUR LAPIDARY

Conducted by J. H. HOWARD*

504 Crescent Ave., Greenville, S. C.

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

*Author of—*The Working of Semi-Precious Stones*, and* Handbook for the Amateur Lapidary*.

Rapid Method of Charging The Diamond Saw

By R. EMMET DOHERTY

Many amateurs shy away from the diamond saw because of the time lost in charging it and the care required to do a good job.

Nicking the edge of the blade with a knife and applying diamond grains with the fingers before tapping them in with a hammer is the accepted manner of charging the saw. This takes time and can be done away with by the following manner:

1.—Be sure the blade is tight on the spindle, be sure it is true. Remove the belt so the saw turns freely.

2.—Place a small glob of medium automobile grease on a saucer. (About the size of a pea for one carat of bort).

3—Pour the crushed bort in the grease, kneading it in with a toothpick or similar instrument.

4.—Use a light hammer having smooth face not more than a quarter of an inch in diameter. A small mechanic's hammer having a ball head can be ground off to suit this purpose.

5.—Dip the hammer in the grease and diamond dust and merely tap the saw, taking care that the hammer is moved from side to side to use all the mixture on its surface. No amount of hammering will shake any of the bort from the grease on the hammer, only that which is driven in the saw's edge is removed. By repeating this process of dipping the hammer in the grease and tapping the saw the job is completed without fuss or muss in a very few minutes.

6.—Wipe the periphery of the blade with a clean cloth to remove any surplus mixture and you are ready to start sawing.

A fourteen inch spring copper disc can be loaded in twenty minutes with ease.

R. & M. A. Geological Field Trip---Sunday, April 19th at 1:00 P. M.

Weather permitting, a geological field trip will be held Sunday, April 19th, by the Rocks and Minerals Association. The activities will be centered in the Anthony's Nose area north of Peekskill, N. Y.

The trip will cover the examination of a graphite mine; granite paving block quarry; granite, gneiss, pegmatite, diabase and schist outcrops; strikes, faults, dips, glacial phenomena and other features. The course of a diabase dike, outcropping at the very edge of the Hudson River, will be traced up the mountain as far as it can be followed (it outcrops at intervals for at least one-half mile).

The trip will cover about 5 miles of walking over very rough country; consequently old clothes and stout shoes should be worn. Equipment needed includes any or all of the following:—hammer, collecting bag, magnifying glass, notebook, pencil and camera.

The meeting place will be Roa Hook (1:00 P.M.) (R. R. Station for Camp Smith—trains do not stop there) one mile north of Peekskill and on the Hudson River. Those coming by train, get off at Peekskill and walk north—take Water Street which parallels the R. R.—cross drawbridge at extreme north end of Peekskill. Roa Hook is the open-air station, on the right, about 1,000 feet further.

Those coming by car may likewise go direct to Roa Hook. Head first for Camp Smith; on reaching its entrance continue on the main road, take the dirt road at the concrete bridge, and go straight for the river and Roa Hook (about 1,000 feet from Camp Smith). A party will also gather at the offices of ROCKS *and* MINERALS, 157 Wells Street, Peekskill at 12:45 P. M.

A PEEK AT OUR MAIL

A Teacher Speaks

Modesto, Calif.—Enclosed find check for another year of the very best of the magazines of its class. Not only do I enjoy every number of it, but many of my students get much information and a real stimulation in observation and study of minerals. Several of them are riding the hobby hard and at least three of them have made this study their business and profession.—*Will L. Brown.*

A Mighty Fine Magazine

Colome, S. D.—I have just finished a two hour session of what I call real, good enjoyment—reading through the February issue of the mighty fine magazine ROCKS *and* MINERALS. Especially did I enjoy the article by Elmer N. Anderson on "Collecting Minerals on Vacation"; and the contribution by Wm. J. Bingham on "Mud Sawing."—*Geo. H. LaBoda.*

"Discovered" Rocks and Minerals

Cove, Ore.—It was by the smallest chance that I "discovered" ROCKS *and* MINERALS and sent for a trial subscription. I will never regret that I did so. Your booklet entitled "How to Collect Minerals" by Peter Zodac is both highly intertaining and instructive. I would not part with it now for many times its regular price.

I think that ROCKS *and* MINERALS merits a wider circulation than it has at present and that there are many more people who would be eager to subscribe to it once it is introduced to them— *Logan Anderson, Jr.*

A Subscriber Since 1927

Portland, Ore.—I note you are giving some good premiums for renewals and new subscriptions. This is a good idea and should be stressed. However, to us old vanguards of ROCKS *and* MINERALS, please omit premiums; we need no spur to renew or to obtain new subscribers.—*John M. Tracy.*

Glad To Hear It

Milwaukee, Wisc.—I wish to renew my subscription to your magazine. I have taken ROCKS *and* MINERALS for two years and find it one of the most interesting magazines issued—*Kern C. Jackson.*

Keep Up The Good Work

West Haven, Conn.—I get a great deal of enjoyment from ROCKS *and* MINERALS. Keep up the good work.—*Herbert A. Smith.*

May It Never Stop Rolling

Claremont, Calif.—I have often expressed the opinion that it was Peter Zodac who started the mineral "ball" rolling.—*R. M. Colcord.*

ACKNOWLEDGMENTS

American Mineral Exchange, Houston, Texas.—An unusually fine specimen of Wood Opal from near Huntsville, Walker Co., Texas.

Brock, C. L., Houston, Texas.—First Day Cover, Texas Centennial Stamp, mailed March 2nd, from Gonzales, Texas.

ISAAC WINGERT BYERS

Dec. 16th, 1866—Feb. 26th, 1936

Isaac Wingert Byers, attorney, soldier banker, and organizer, died Wednesday, February 26th, 1936 at 6:30 P. M. Death was attributed to cancer and he was buried with full military honors in the Arlington National Cemetery, Washington, D. C.

Mr. Byers was born at Jackson Hall, near Chambersburg, Penn., Dec. 16th, 1866. While still very young, his father and mother died and he was brought up by an aunt, Mrs. Anna Hade of Greencastle, Penn. His early education was obtained at the local public schools, then at the State Normal School at Kutztown, Penn., and finally completing it at Princeton University from which he was graduated in 1893, specializing in law. The same year he married Elizabeth Rosenstock.

A year later he was admitted to the bar and practiced law in Chicago. But failing health forced him to seek strength in the north country of Michigan, at Iron River.

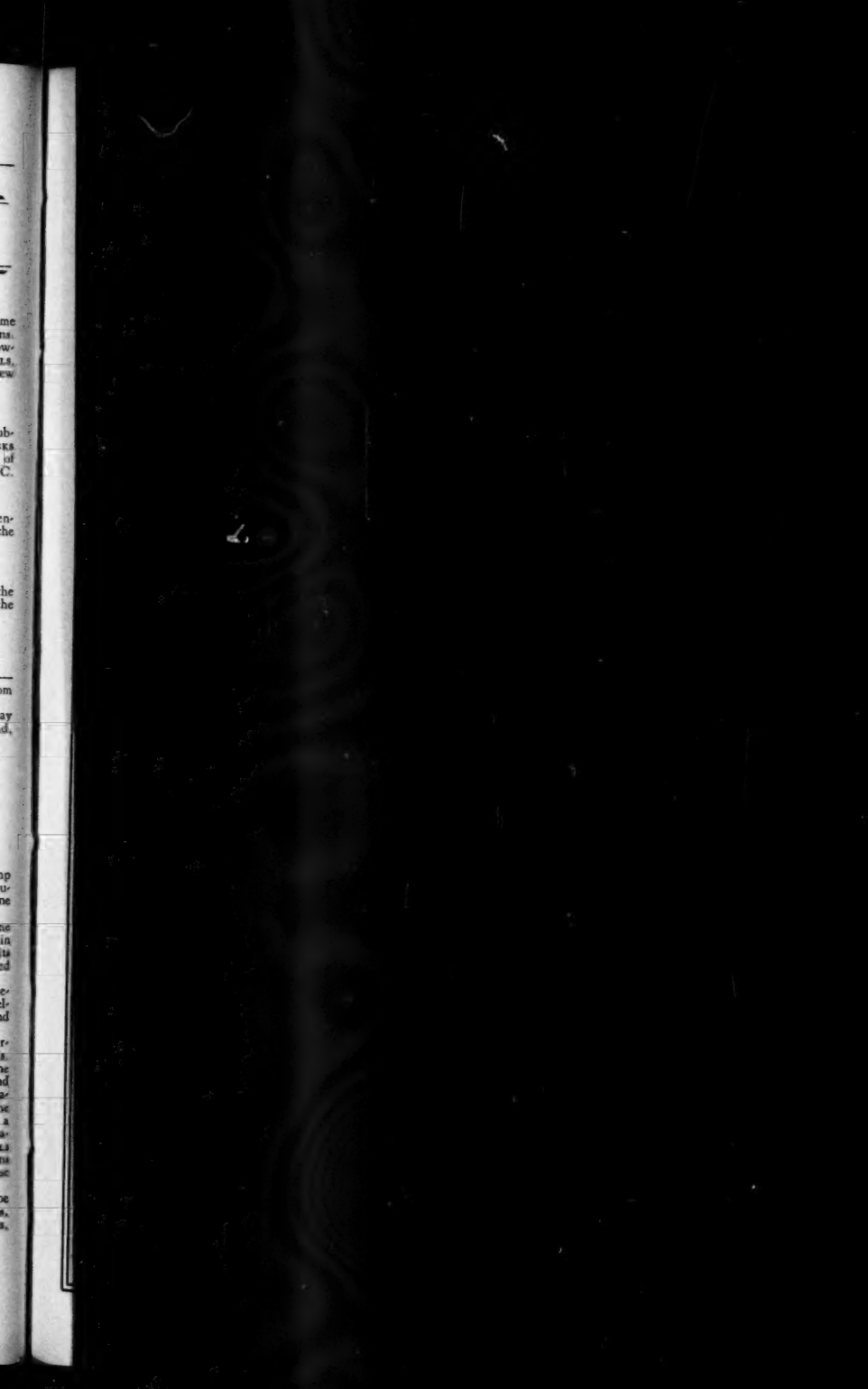
For more than 40 years, Mr. Byers was a vital figure in the development of Iron River and was instrumental in many important enterprises and improvements. His death is a severe blow to his community and to his host of friends and acquaintances.

Shortly before the World's War, his wife died. Later, with the entry of the United States into the war, Mr. Byers, although past the age limit, enlisted, was sent to the officers' training camp at Fort Sheridan, and commissioned a First Lieutenant. He saw active service in the Argonne sector.

Returning from the war, Mr. Byers became interested in the American Securities Bank in Iron Mountain, Mich., and for a time was its President. It was around this time that he married as his second bride, Chloe Morrell.

For the last ten years he lived in virtual retirement, spending summers at home and traveling widely throughout the United States and Europe.

Mr. Byers was especially interested in mineralogy and had an excellent collection of minerals. He visited many of the important localities of the country and even made special trips to attend two outings of the Rocks and Minerals Association—one held at Newry, Maine, in 1933; the other at Tilly Foster, N. Y., in 1934. He was a loyal member of the Rocks and Minerals Association and a warm friend of ROCKS *and* MINERALS and its Editor. He made many contributions to the support of the magazine and otherwise endeared himself to the Editor.

Mr. Byers is survived by his wife, Mrs. Chloe M. Byers, by three daughters, Miss Anna Byers, Mrs. Judith McCormick, and Mrs. Ruth Reynolds, and a son, Benjamin.

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